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New record of the Critically Endangered striped smooth-hound, *Mustelus fasciatus* (Garman, 1913) (Chondrichthyes, Triakidae), in the Southwest Atlantic

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Abstract

We report the southernmost known occurrence in the Atlantic Ocean of the striped smooth-hound, *Mustelus fasciatus* (Garman, 1913). The shark, a female measuring 106 cm TL, was fished in warm coastal waters, with a salinity of 33,189 PSU, of central Argentina (40°52′13″ S, 062°18′42″ W). This report increases by 205 km southward the known range of this endemic and Critically Endangered species.

Key words

Sharks, distribution, endemic, elasmobranch, Argentina.

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Introduction

The striped smooth-hound, *Mustelus fasciatus*, is an endemic species from the Southwest Atlantic (SWA) with a narrow geographic distribution between Brazil (30° S) and Argentina (39°30′ S), in the Argentine Province zoogeographic region (Soto 2001, Balech and Erlich 2008). *Mustelus fasciatus* is a subtropical demersal species which lives at the surface to to depths of 250 m but usually up to 50 m. The reproductive biology of the species is poorly known and is based on specimens from Rio Grande do Sul, southern Brazil (Soto 2001).

In Argentina, the genus *Mustelus* (Link, 1790) is represented by 3 species: *Mustelus canis* (Mitchill, 1815), *M. schmitti* (Springer, 1939), and *M. fasciatus*. In the 1950s, between October and February, specimens of *M. fasciatus* were caught on the Buenos Aires coast by a regional commercial fleet (Nani 1964), but its presence in the area was recorded as occasional in the port of Mar del Plata (Menni et al. 1986). The southernmost occurrence of this species in the SWA was recorded in the spring, at Bahía Blanca (38°43 'S, 062°16′ W) and it was a female of 950 cm total length (López Cazorla and Menni 1983).

Musteus fasciatus had been overfished during the last decades of 20th centuryin the state of Rio Grande do Sul, southern Brazil in an area where there an important aggregation of these sharks. As as result, in 2004 it was classified using IUCN criteria as Criticaly Endangered (Hozbor et al. 2004). We report here the most southern record of *M. fasciatus* in the Southwestern Atlantic.

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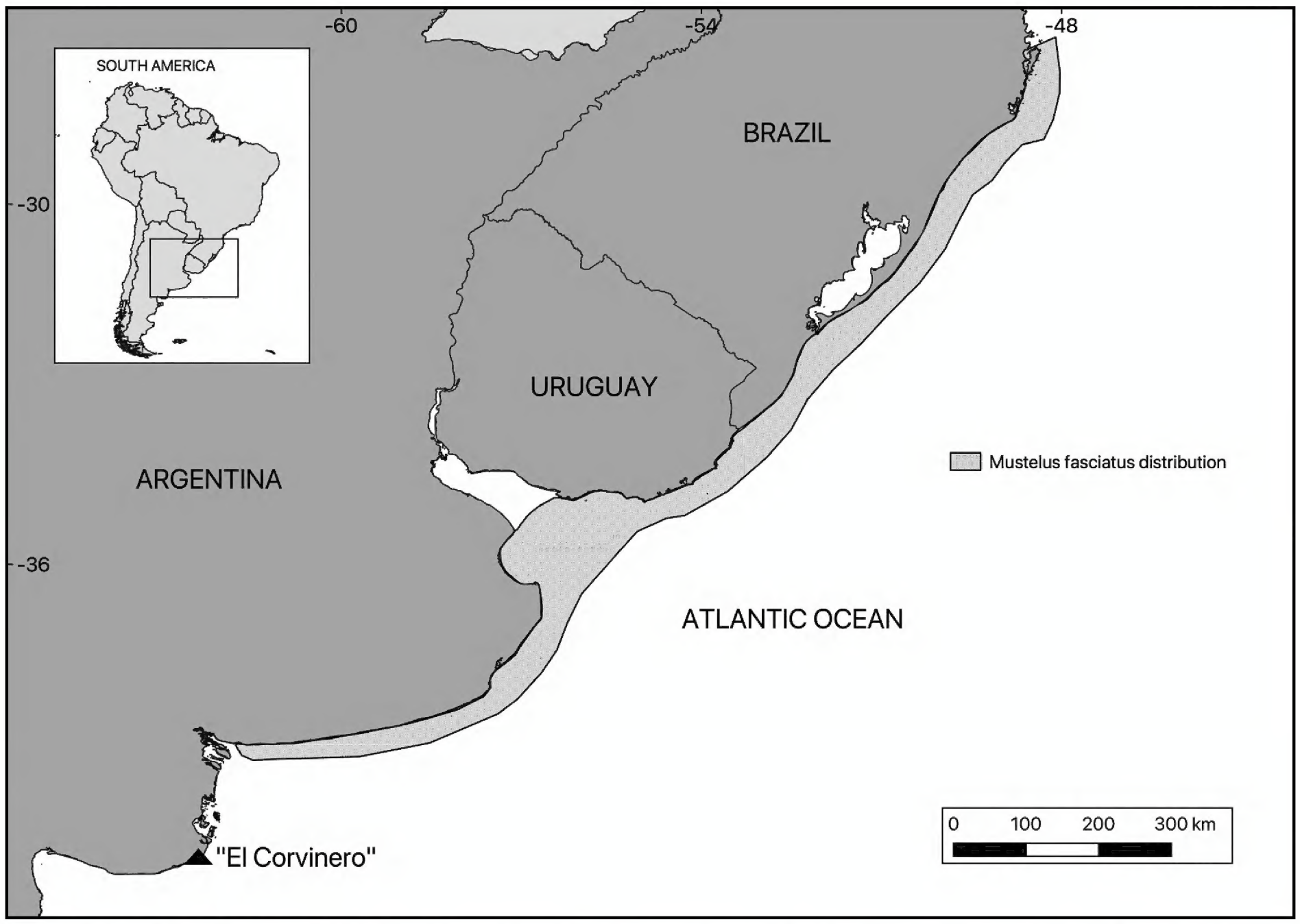

Figure 1. Map of Southwest Atlantic Ocean. The gray area indicates the previous distribution of *Mustelus fasciatus*. Black triangle indicates the new record.

Methods

The specimen of *M. fasciatus* reported in this paper was captured using rod and reel, videorecorded, and released alive by a local angler who participates in a shark tagging program ("Conservar Tiburones en Argentina"). The sea surface temperature (SST), salinity, and chlorophylla were obtained from the Ocean Color and Coastwatch website (http://coastwatch.pfeg.noaa.gov)

Results

New record. Argentina: Buenos Aires province. Carmen de Patagones, "El Corvinero" (40°52′13″ S, 062°18′42″ W), Fernando Riera, 13 December 2017 (1 specimen, female).

The individual was a juvenile, 106 cm TL, and with ectoparasites (none collected nor identified) attached to its first dorsal fin. The capture was during late spring between first daily high tide (08.56 h, height 2.0 m) and second low tide (15.17 h, height 0.4 m), sunrise: 05.32 h, sunset: 20.35 h, moon: between third quarter and new moon. The individual was captured between 250 and 300 m off shore and over a sandy bottom with isolated rocks. The SST was 18.45 °C, the salinity was 33.189 PSU, and chlorophyll concentration was 2.93 mg/m^3.

Identification. The prepectoral distance was greater than the interdorsal space and the horizontal diameter of the eye was contained 3.5 times in the preorbital snout length. As a young individual, the vertical dark bars on the body were present and the white or dark spots absent. The specimen also had small eyes, long head, a large pointed snout, and a short caudal peduncle.

Discussion

Mustelus fasciatus was first decribed by Garman (1913) based on juvenile specimens that can be easily identified by their dark vertical bars. Later, Sadowski (1977) defined the relationship in adults between the eye-length and the nose-length as a key difference for this species among the others of the genus. Information about the biology of the species is not well known and comes only from a nursery area located in southern Brazil (Soto 2001). This area is the only recorded site with important aggregations of individuals; during the 1980s, this species was relatively abundant and commercially? fished. At that time, a great number of neonates were caught with bottom gillnets, mainly during summer. Since 1980, these captures dropped off at least 90% of the abundance of adults in Brazilian waters (Instituto Chico Mendez 2016).

In the Argentina–Uruguay Common Fishing Zone (AUCFZ), the biomass of *M. fasciatus* decreased 96% between 1994 and 1999 according to bottom trawl surveys. The Argentine comercial fleet also has confirmed

Figure 2. Specimen of *Mustelus fasciatus* from "El corvinero", it was captured using rand released alive by a local angler.

this absence in scientific surveys made during the 1990s (Massa 2012). This downward trend in the population in the AUCFZ has also been observed in Uruguay; during scientific surveys there, only 2 individuals were captured in fall of 2001 (1 female, TL = 157 cm, weigth = 25.2 kg, depth = 20 m; 1 unsexed individual, TL not recorded, weigth = 17.4 kg, depth = 22 m) (L. Paesh pers. comm.).

The situation is critical for this species within its rather restricted range, where industrial, artisanal, and recreational fishing still occur along the coasts of Brazil, Uruguay, and Argentina. Of note is the possible summer migration of the *M. fasciatus* from southern Brazil to Uruguay and Argentina (Vooren and Klippel 2005).

As with any coastal shark species, the vulnerability of *M. fasciatus* is exasperated by the location shallowness (1–5 m deep) of its nursery areas near the coast, which increases the probability of the capture of neonates (TL = 39 cm) (Soto 2001). According to Soto (2001), there is clear zonification by depth of these sharks in different age groups: neonates at depths of 1–5 m, juveniles at 15–50 m, and adults at 50–250 m. The juvenile captured in our study was fished at a similar depth range as the one captured in southern Brazil, i.e. in a sandy channel area. Such habiats might be used as refugee from larger sharks such as the sevengill, *Notorynchus cepedianus* (Péron, 1807).

Our study records the southern limit in the SWA of *M. fasciatus*. The new record is 205 km south of the previously known southernmost record, which is now 35 years old. The decline in the population over the last decades in its main nursery area, as well as the very sporadic observations throughout its geographic range, signals the need for a coordinated species recovery plan between Brazil, Uruguay and Argentina.

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Authors' Contributions

JMC and MLG identified the species; SEG edit the photographs of the specimens; JMC, MLG and SEG wrote the manuscript; all authors reviewed the text.

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